



# Climate Education for a Changing Bay Expansion

## Project Overview

### Project Location

Chesapeake Bay National Estuarine Research Reserve – Virginia

### Project Duration

June 2016 to November 2018

### Project Lead

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### Project Type

Science Transfer — promoting the use of science

### Products

[Lesson plans](#) for high school students that examine sea level rise scenarios through marsh transects and assess the county's readiness through a role-playing scenario

### Project Partners

- Chesapeake Bay National Estuarine Research Reserve – Virginia
- Gloucester County Schools
- Mathews County Schools
- Middlesex County Schools
- Virginia Institute for Marine Sciences

In coastal Virginia, Mathews, Gloucester, and Middlesex Counties are experiencing rates of sea level rise that are relatively greater than the global average. Understanding changes in sea level rise and inundation—and their impacts on habitat and coastal communities—is key to building a resilient Chesapeake Bay.

Climate Education for a Changing Bay, a previous NOAA Bay Watershed Education and Training [project](#), sought to enhance high school students' understanding of sea level rise and climate change by providing watershed educational experiences integrated into the classroom in Gloucester and Mathews Counties. Using locally relevant environmental data compiled through the Chesapeake Bay Sentinel Site [Cooperative](#), that previous project developed a classroom curriculum for ninth graders, field experiences, and professional teacher training.

This project expanded the reach of Climate Education for a Changing Bay into Middlesex County, and developed an alumni-mentoring program to support its ongoing presence in Gloucester and Mathews County. Its goal was to continue to enhance climate literacy in coastal Virginia and to advance the use of locally relevant environmental data and information in the classroom.

## Project Benefits

This project resulted in several beneficial outcomes for targeted end users, including ninth grade earth science teachers and students and reserve staff. These included the following:

- An increase in teachers' awareness, knowledge, and confidence in teaching concepts of sea level rise and climate change to ninth grade students. One hundred percent of teachers involved in the project reportedly plan to use the resources in the future, stating that the program was a good use of their time and their students' time.
- A demonstrable improvement in ninth grade students' understanding of climate science. Pre- and post-tests completed by participating students in four out of five classrooms showed statistically significant improvement in their understanding of relevant climate-related topics.

- An increase in reserve staff members' confidence and ability to conduct statistical analysis of project results, as well as their increased understanding of the complexities of mentor relationships. Although the creation of mentor relationships was more difficult than the project team had anticipated, they learned valuable lessons that will be helpful in continuing to support the program in the future.

## Project Approach

Middlesex County received the full Climate Education for a Changing Bay program, including teacher professional development through informal meetings and trainings, an introductory classroom visit, schoolyard field experience, and an offsite field experience for the entire ninth-grade student population provided by Chesapeake Bay – Virginia Reserve education staff members. Gloucester and Mathews County teachers participated in a mentoring program, with the opportunity to receive updated training and data, and funds to continue offering the program's activities to their students.

The project approach included three main components:

- **Climate curriculum in the classroom** – The Climate Education for a Changing Bay program used data and information collected by the research and stewardship programs at Chesapeake Bay – Virginia Reserve to update the existing curriculum.
- **Classroom and field experiences** – Students from Middlesex County participated in one classroom lesson, one schoolyard field experience, and one offsite field experience delivered by Chesapeake Bay – Virginia Reserve educators. Students from Gloucester and Mathews Counties participated in classroom lessons and field experiences delivered by their teachers.
- **Mentoring** – Previous participants in the program received guidance, support, and stipends to continue the use of the curriculum both in the classroom and in the field. In the second year of funding, teachers from Middlesex County were also included in the mentoring program, and all teachers were then responsible for leading the classroom lessons and field experiences themselves with guidance from educators from Chesapeake Bay – Virginia Reserve.

## What's Next

The project team plans to work on a journal article summarizing results from the project to share details about the program with the broader community of science educators.

### About the Science Collaborative

*The National Estuarine Research Reserve System's Science Collaborative supports collaborative research that addresses coastal management problems important to the reserves. The Science Collaborative is managed by the University of Michigan's Water Center through a cooperative agreement with the National Oceanic and Atmospheric Administration (NOAA). Funding for the research reserves and this program comes from NOAA. Learn more at [coast.noaa.gov/nerrs](https://coast.noaa.gov/nerrs) or [nerrsciencecollaborative.org](https://nerrsciencecollaborative.org).*